

stomach. This is a very free translation of *présure*, which really means rennet. Not having seen the book in the original French, it is a little difficult to apportion the blame between Dr. Gouraud and his translator. Internal evidence leads one, however, to conclude that both are at fault.

The book is a curious and muddled medley of fact and fancy; the translation has evidently been carried out by someone unfamiliar with physiology, and deficient in his knowledge of both French and English.

W. D. H.

OUR BOOK SHELF.

Lilies. By A. Grove. Pp. xi+116+8 coloured plates. *Apples and Pears.* By G. Bunyard. Pp. xi+116+8 coloured plates.

(Present-day Gardening Series.) (London and Edinburgh: T. C. and E. C. Jack, n.d.) Price 1s. 6d. each.

MR. GROVE'S book on lilies is one of the most welcome that have appeared in this series. Among popular flowers the genus is, perhaps, the most trying with which English gardeners have to deal, and the presence of many species in our gardens is due more to the efficiency and rapidity of ocean transit than to a proved capability of our cultivators to grow them in gardens. It is probably to the facility with which stocks can be renewed that the present unsatisfactory state of lily cultivation is largely due. The incentive to conquer the problems of keeping them alive and propagating them are, to a great extent, lacking when a new and vigorous stock can be easily obtained from the salerooms. Mr. Grove is, however, an enthusiast, and we have it on the authority of Mr. Elwes—himself the author of a classical work on the genus—that he knows more about their cultivation than anyone else living. There is no botany in the work; it is purely a gardening book cleverly and pleasantly written by a master of his subject. Mr. Elwes contributes an interesting preface.

Mr. Grove's study of lilies has been carried on unostentatiously in his garden on the Berkshire hills, and his name is comparatively unknown except to the *élite*. It is otherwise with Mr. Bunyard. As the head of one of the first fruit-tree nurseries, and an experienced author on hardy fruits, he has long filled a high place in the esteem of those occupied in the same pursuits. The present little volume is certainly one of the best that has ever appeared on the subject of apples and pears. Although concise it is comprehensive, and deals efficiently with every phase of their treatment. The author gives lists of the best sorts for various purposes and different districts, all the better because they are comparatively short. He deals with their cultivation from the propagation and planting of the trees, and the way to combat insect pests, to the storing of the fruit. The state of many orchards of this country impels one to hope that this book may be widely read.

Each of these volumes is illustrated by eight coloured plates, and makes a very creditable addition to the useful series to which it belongs.

The Animal World. By Prof. F. W. Gamble, F.R.S. With an Introduction by Sir Oliver Lodge, F.R.S. (Home University Library of Modern Knowledge.) Pp. 255. (London: Williams and Norgate; New York: Henry Holt and Co., n.d.) Price 1s. net.

PROF. GAMBLE'S account of the animal world is written from the point of view of function. Its chief aim is to direct attention to the adaptations of structure to the performance of movement, breathing, and

other vital functions. An introductory chapter, which contains a general survey of the structure and classification of animals, is rather condensed, and will probably be more useful to the reader who has already a little knowledge of animal life than to the beginner. The description of the movements, and of the succession and distribution of animals, provides opportunity for pointing out the great advantages possessed by birds and mammals in consequence of their warm blood. The quest for food, modes of breathing, the colours and senses of animals, societies and associations, symbiosis, the care of the young, and short accounts of the life-history of a few animals, form the subjects of successive chapters. The concluding chapter on heredity and variation might well have been a little more extended: the subject-matter is too briefly explained to be of full value to the reader for whom the book is intended.

Several of the figures are crude, especially that of *Vorticella*. The statement on p. 28 that the buds of coelenterates may remain in connection with the parent tissues "by strings of mesenchyme" requires modification. On p. 37 the spaces between the mesenteries of a sea-anemone are designated the *cœlom*, and immediately below are referred to as increasing the capacity of the digestive cavity.

The book, which is written in a fresh clear style, is characterised throughout by breadth of view, and is also noteworthy for the aptness of the illustrative examples cited. The thoughtful reader, with an interest in biology, will find in this volume food for thought in abundant measure.

Orthochromatic Filters. Pp. 55. (Croydon: Wratten and Wainwright, Ltd., n.d.) Price 6d.

THE title of this little book does not include its contents, for there is a chapter on "contrast filters," with some very striking examples of their use. A photograph of an engineers' blue print taken through a strong red filter that needs the exposure to be increased twenty-four times with a Wratten's panchromatic plate, renders the blue as a full black, instead of the rather feeble grey given by an ordinary plate with no filter. The great improvement obtainable in the rendering of the grain of dark-coloured woods, as well as in other cases, is well illustrated. We learn that the sensitiveness to green and red of ordinary orthochromatic plates is generally from 2 to 5 per cent. of the total sensitiveness, while in a panchromatic plate this rises to as much as 18 per cent. From these and other figures of a like nature the necessary increase of exposure when using certain colour filters with various specially sensitised plates is calculated in a simple way. The chapter that will be of most interest to those who are fairly familiar with the use of colour filters and sensitised plates, deals with the optical properties of filters. It gives clear examples of the degradation of defining power of the lens by the use of a filter strained by being too tightly screwed up in its cell, and also of filters which introduce various degrees of astigmatism. Many other matters are dealt with which are of prime importance to those who use colour screens.

Studies of Trees and Flowers. By M. Wrigley. With descriptions by Annie L. Smith. Pp. 129+vi+129 plates. (London: Methuen and Co., Ltd., n.d.) Price 15s. net.

THE photographs that form the chief feature of this weighty volume reflect considerable credit on the skill of the author as a manipulator with the camera. Undoubtedly the most impressive are the photographs of plants *in situ*; the picture of the foxglove is good, except that it fails to show the lower portion of the

plant; those of the birches, especially of the silver birch and of the Burnham beeches, are instructive, but the best are the illustrations of two groups of Scotch firs at Kincaig that betoken group as well as individual habit. Many of the sprays, notably of the blossoming myrtle and hawthorn, and of the fruiting broom, are attractive, but it is not apparent that any useful purpose is served by these or the general collection, since it is not difficult and more advisable to obtain natural specimens in season. Miss Lorrain Smith has carried out satisfactorily the task of supplying appropriate brief notes, and doubtless appreciated the *Peziza* and *Usnea* that appear at the end.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

The Ooze of the Thames.

SOME time ago I directed attention to the part played by annelids in making the ooze of rivers, such as the Nile, fertile. Aided by a Government grant, research has been continued during the year, and in August a special visit was paid to Kew Gardens and the Thames. The river was very low, and I was able to collect specimens which are not always available, and bring away a sample of the ooze for careful examination. I found the mud teeming with *Helodrilus oculatus*, Hoffm., a new record for the south of England; *Paranais naidina*, Bretscher, new to Britain; *Monopylephorus elegans*, Friend, new to science; and other things, showing how much work still remains to be done by London naturalists. There were also many living nematodes, all apparently belonging to one species, half an inch or more in length. I have not yet been able to work out its history or discover its host, but the thing which seems to me to be of special interest relates to this parasitic creature. In examining the ooze from time to time the thing that struck one was the presence of numberless white threads of considerable length and great tenuity. These proved to be the integuments of vast numbers of dead nematodes. In the case of annelids, the process of decay is so rapid that dead worms are rarely found, and only by means of the most careful microscopic examination or chemical analysis can one discover how numerous they have been. But the evidence goes to show that the ooze of rivers is immensely enriched in nitrogenous matter year by year through the death of annelids, as well as oxygenated by their tireless movements.

While much has been done in the analysis of soils, little if anything seems to have been undertaken in relation to ooze. My own researches are at present largely restricted to the systematic study of the living species of annelids; but it would be of immense advantage to science, and especially to agriculture, if some expert like Dr. Russell could give us careful analyses of river oozes. I have appealed many times for samples of ooze from estuaries and rivers in order that something might be done, but hitherto the response has been very heartless, and there has been no alternative but to make special journeys to interesting localities, at great cost of time and money. The importance of the subject, however, is such that I venture again to bring it to the notice of students and investigators in the hope that it may receive the attention it deserves.

Swadlincote, September 16.

HILDERIC FRIEND.

Ancient Forests in Scotland.

REFERRING to your correspondent's letters which appeared in NATURE of June 1 and August 24 last in regard to the contemplated cutting down of the fir trees at Auchnacarry, in south Inverness-shire, permit me to state that, though very old (say two to three hundred years), these cannot properly be said to have formed part of the ancient Caledonian Forest. The fir was very probably found in

the latter, and in certain places it may have been the prevailing description; unquestionably it is the most prominent survivor, and during the last few centuries has been one of the most important economical products of the Highlands of Scotland.

The cause of the disappearance of the Caledonian Forest has hitherto seemed obscure, if not inexplicable. Some light, however, is perhaps afforded by the fact that over the entire area which it covered, say all the counties north of the Firths of Forth and Clyde, except perhaps the Isle of Bute, Fife, Caithness, and the Orkney and Shetland Islands, the surface is frequently bestrewn with iron slags. So numerous are these latter in some districts that a hundred heaps of slag may be found almost within the confines of a single parish. From an examination of the pieces of charcoal found amongst these slags it has been ascertained that when these were formed the principal trees in the neighbourhood were birch and oak, but in some instances traces have been found of beech, ash, elm, fir, and holly.

Evidently in the more ancient times, namely, before the use of water-power was introduced in Scotland for the extraction of iron from the ore, two processes were successively employed for the purpose. In the earliest, the natural wind was taken advantage of, and the seat of operations was determined by the favourable physical configuration of the land to guide and concentrate the blast on the materials of combustion. From one document, at least, we learn that this method seems to have been employed down to 900 years ago. The sites associated with the later or succeeding process, and at which, presumably, bellows were used, are all in sheltered positions where the remaining forests were located; a few of the very last of these in operation can be dated as belonging to the fourteenth and fifteenth centuries. There is reason to believe that the bellows were in use in this connection as early as, if not earlier than, the Roman occupation.

When water-power for iron-making was introduced into Scotland at the beginning of the seventeenth century, the sites chosen were not only in protected situations also, but on low ground, on the banks of rivers, and preferably with suitable wood for fuel in the vicinity; but some of the latter seems to have been rolled down from the heights above, or floated by water from considerable distances. This class of works continued in operation generally until about 1760, and in the case of those near Inverary and Bunane until much more recent years. Charcoal made from pine wood was very largely used at all of this series of works.

From the foregoing it may be gathered that as the iron slag heaps of Scotland form the memorials of her ancient forests, our knowledge of the latter may be much restricted by a neglect of the study of the metallurgical industries there in former times.

GEORGE TURNER.

300 Langside Road, Glasgow, September 4.

"The Polynesian Wanderings."

YOUR review of my book, "The Polynesian Wanderings" (August 10), is warmly appreciated as performing the service of an introduction to scholars interested in the philology of the Pacific. In order to prevent a misconception of the work, I ask leave to note an exception to one or two statements in the review which might produce a wrong impression.

Mr. Ray comments upon the incommensurability of the several languages of Polynesia and Melanesia. What he puts in a few lines I had discussed in pages, and had announced that it was impracticable, in our present knowledge of Melanesian speech, to essay a quantitative comparison. On pp. 142 and 143 of the volume I have been at pains to establish my method of comparison by computing a coefficient of recognisability of the Proto-Samoan borrowed element in some ninety Melanesian languages. This is a figure which may be reached independently of the quantity of the loan material; it rests upon each borrowed word by itself in comparison with the same word as found in the present speech of Nuclear Polynesia; it expresses the extent of the deviation from the norm. The determination of quantity lying beyond our reach at present, I have utilised the only element of comparison which in years of research I have been able to discover,